Genalex

BEAM TETRODE

BRIEF DATA

The KT88 has an absolute maximum anode dissipation rating of 42W and is designed for use in the output stage of an a.f. amplifier. Two valves in Class AB1 give a continuous output of up to 100W. The KT88 is also suitable for use as a series valve in a stabilised power supply.
The KT88 is a commercial version of the CV5220 and is similar to the 6550.

HEATER

V_h	6.3	V
I_h (approx)	1.6	A

MAXIMUM RATINGS

	Absolute	Design Maximum	
V_a	800	800	V
V_{g2}	600	600	V
$V_{a,g2}$	600	600	V
$-V_{g1}$	200	200	V
p_a	42	35	W
p_{g2}	8	6	W
p_{a+g2}	46	40	W
I_k	230	230	mA
V_{h-k}	250	200	V
T_{bulb}	250	250	°C
R_{g1-k} (cathode bias)			
$p_{a+g2} \leqslant 35W$	470		kΩ
$p_{a+g2} > 35W$	270		kΩ
R_{g1-k} (fixed bias)			
$p_{a+g2} \leqslant 35W$	220		kΩ
$p_{a+g2} > 35W$	100		kΩ

CAPACITANCES (Measured on a cold unscreened valve)

Triode Connection

$c_{g1-a,g2}$	7.9	pF
$c_{g1-all\ less\ a,g2}$	9.3	pF
$c_{a,g2-all\ less\ g1}$	17	pF

Tetrode Connection

c_{g1-a}	1.2	pF
$c_{g1-all\ less\ a}$	16	pF
$c_{a-all\ less\ g1}$	12	pF

CHARACTERISTICS

Tetrode Connected

V_a	250	V
V_{g2}	250	V
I_a	140	mA
I_{g2} (approx)	3	mA
$-V_{g1}$ (approx)	15	V
g_m	11.5	mA/V
r_a	12	kΩ
$\mu_{g1\text{-}g2}$	8	

Triode Connected

$V_{a,g2}$	250	V
I_{a+g2}	143	mA
$-V_{g1}$ (approx)	15	V
g_m	12	mA/V
r_a	670	Ω
μ	8	

TYPICAL OPERATION

Push-Pull. Class AB1. Cathode Bias. Tetrode Connection

$V_{a(b)}$	560	V
$V_{a(o)}$	521	V
V_{g2}	300	V
$I_{a(o)}$	2 x 64	mA
$I_{a\ (max\ sig)}$	2 x 73	mA
$I_{g2(o)}$	2 x 1.7	mA
$I_{g2\ (max\ sig)}$	2 x 9	mA
$R_{L(a\text{-}a)}$	9	kΩ
*R_k	2 x 460	Ω
$-V_{g1}$ (approx)	30	V
P_{out}	50	W
D_{tot}	3	%
ǂI.M.	11	%
$p_{a(o)}$	2 x 33	W
$p_{a(max\ sig)}$	2 x 12	W
$p_{g2(o)}$	2 x 0.5	W
$p_{g2\ (max\ sig)}$	2 x 2.7	W
$V_{(g1\text{-}g1)(ac)}$ crest	60	V

*It is essential to use two separate cathode bias resistors.
ǂIntermodulation distortion; measured using two input signals at 50 and 6000Hz (ratio of amplitudes 4:1).

Push-Pull. Class AB1. Fixed Bias. Tetrode Connection

Parameter	Value	Unit
$V_{a(b)}$	560	V
$V_{a(o)}$	552	V
V_{g2}	300	V
$I_{a(o)}$	2 x 60	mA
$I_{a\ (max\ sig)}$	2 x 145	mA
$I_{g2(o)}$	2 x 1.7	mA
$I_{g2\ (max\ sig)}$	2 x 15	mA
$R_{L(a\text{-}a)}$	4.5	kΩ
*$-V_{g1}$ (approx)	34	V
P_{out}	100	W
D_{tot}	2.5	%
‡I.M.	10	%
$p_{a(o)}$	2 x 33	W
$p_{a\ (max\ sig)}$	2 x 28	W
$p_{g2(o)}$	2 x 0.5	W
$p_{g2\ (max\ sig)}$	2 x 4.5	W
$V_{(g1\text{-}g1)(ac)}$ crest	67	V

*It is essential to provide two separately adjustable bias voltage sources, having a voltage adjustment range of ±25%.
‡Intermodulation distortion; measured using two input signals at 50 and 6000Hz (ratio of amplitudes 4:1).

Push-Pull. Class AB1. Cathode Bias. Ultra-Linear Connection (40% Tapping Points)

Parameter			Unit
$V_{a,g2(b)}$	500	375	V
$V_{a,g2(o)}$	436	328	V
$I_{a+g2(o)}$	2 x 87	2 x 87	mA
$I_{a+g2\ (max\ sig)}$	2 x 99	2 x 96	mA
$R_{L(a\text{-}a)}$	6	5	kΩ
*R_k	2 x 600	2 x 400	Ω
$-V_{g1}$ (approx)	52	35	V
P_{out}	50	30	W
D_{tot}	1.5	1	%
‡I.M.	4	3	%
$p_{a+g2(o)}$	2 x 38	2 x 28.5	W
$p_{a+g2\ (max\ sig)}$	2 x 17	2 x 16	W
$V_{(g1\text{-}g1)(ac)}$ crest	104	71	V
Z_{out}	4.8	4.5	kΩ

*It is essential to use two separate cathode bias resistors.
‡Intermodulation distortion; measured using two input signals at 50 and 6000Hz (ratio of amplitudes 4:1).

Push-Pull. Class AB1. Fixed Bias. Ultra-Linear Connection. (40% Tapping Points)

$V_{a,g2(b)}$	560	460	V
$V_{a,g2(o)}$	553	453	V
$I_{a+g2(o)}$	2 x 50	2 x 50	mA
$I_{a+g2\ (max\ sig)}$	2 x 157	2 x 140	mA
$R_{L(a-a)}$	4.5	4	kΩ
*$-V_{g1}$ (approx)	75	59	V
P_{out}	100	70	W
D_{tot}	2	2	%
‡I.M.	11	10	%
$p_{a+g2(o)}$	2 x 27.5	2 x 22.5	W
$p_{a+g2\ (max\ sig)}$	2 x 33	2 x 27	W
$V_{(g1-g1)(ac)}$ crest	140	114	V
Z_{out}	7	6.5	kΩ

*It is essential to provide two separately adjustable bias voltage sources, having a voltage adjustment range of ±25%.
‡Intermodulation distortion; measured using two input signals at 50 and 6000Hz (ratio of amplitudes 4:1).

Push-Pull. Class AB1. Cathode Bias. Triode Connection

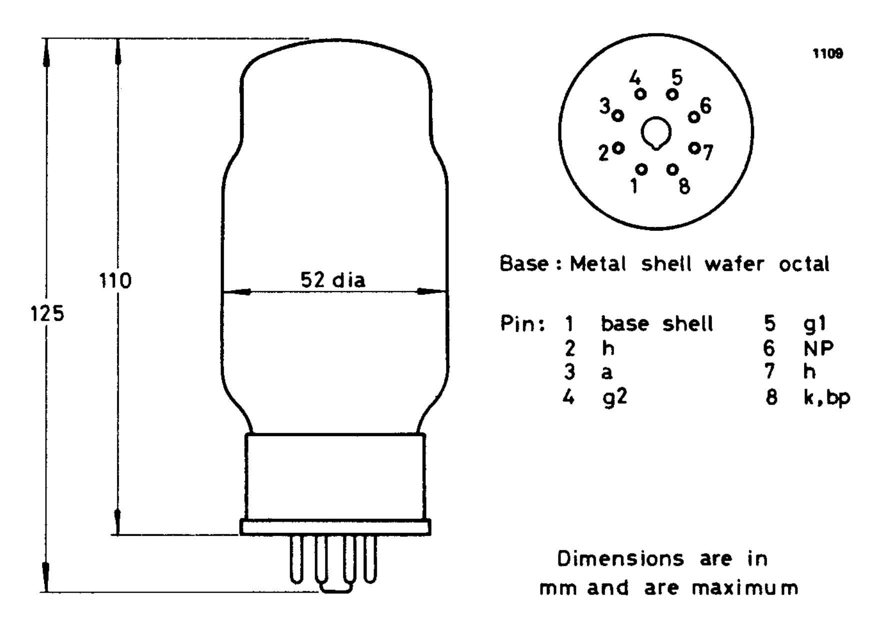
$V_{a,g2(b)}$	400	485	V
$V_{a,g2(o)}$	349	422	V
$I_{a+g2(o)}$	2 x 76	2 x 94	mA
$I_{a+g2\ (max\ sig)}$	2 x 80	2 x 101	mA
$R_{L(a-a)}$	4	4	kΩ
$-V_{g1}$ (approx)	40	50	V
P_{out}	17	31	W
D_{tot}	1.5	1.5	%
*I.M.	5.6	5.6	%
$p_{a+g2(o)}$	2 x 26.5	2 x 40	W
$p_{a+g2\ (max\ sig)}$	2 x 19	2 x 27	W
R_k	2 x 525	2 x 525	Ω
$V_{(g1-g1)(ac)}$ crest	78	114	V
Z_{out}	2	1.9	kΩ

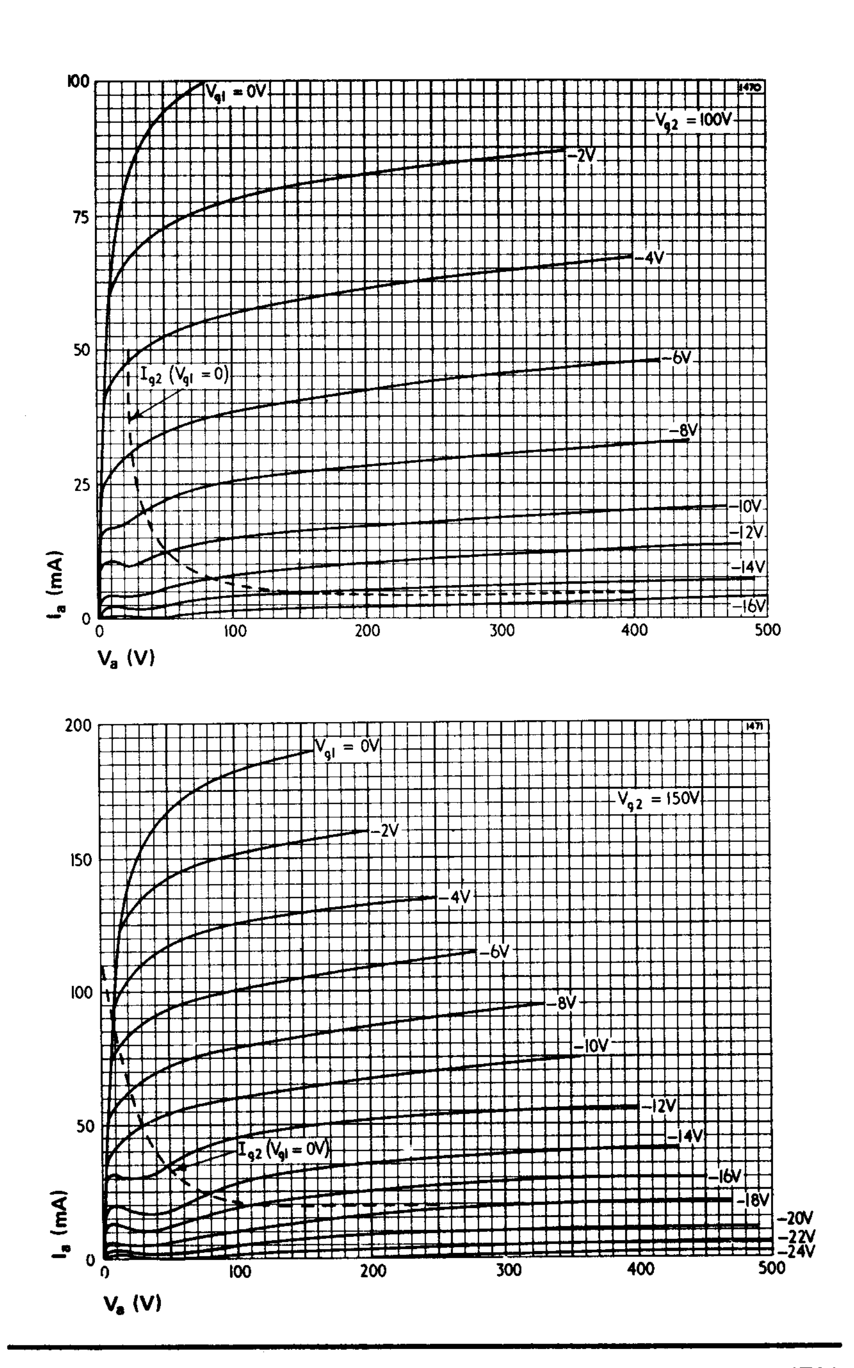
*Intermodulation distortion; measured using two input signals at 50 and 6000Hz (ratio of amplitudes 4:1).

INSTALLATION

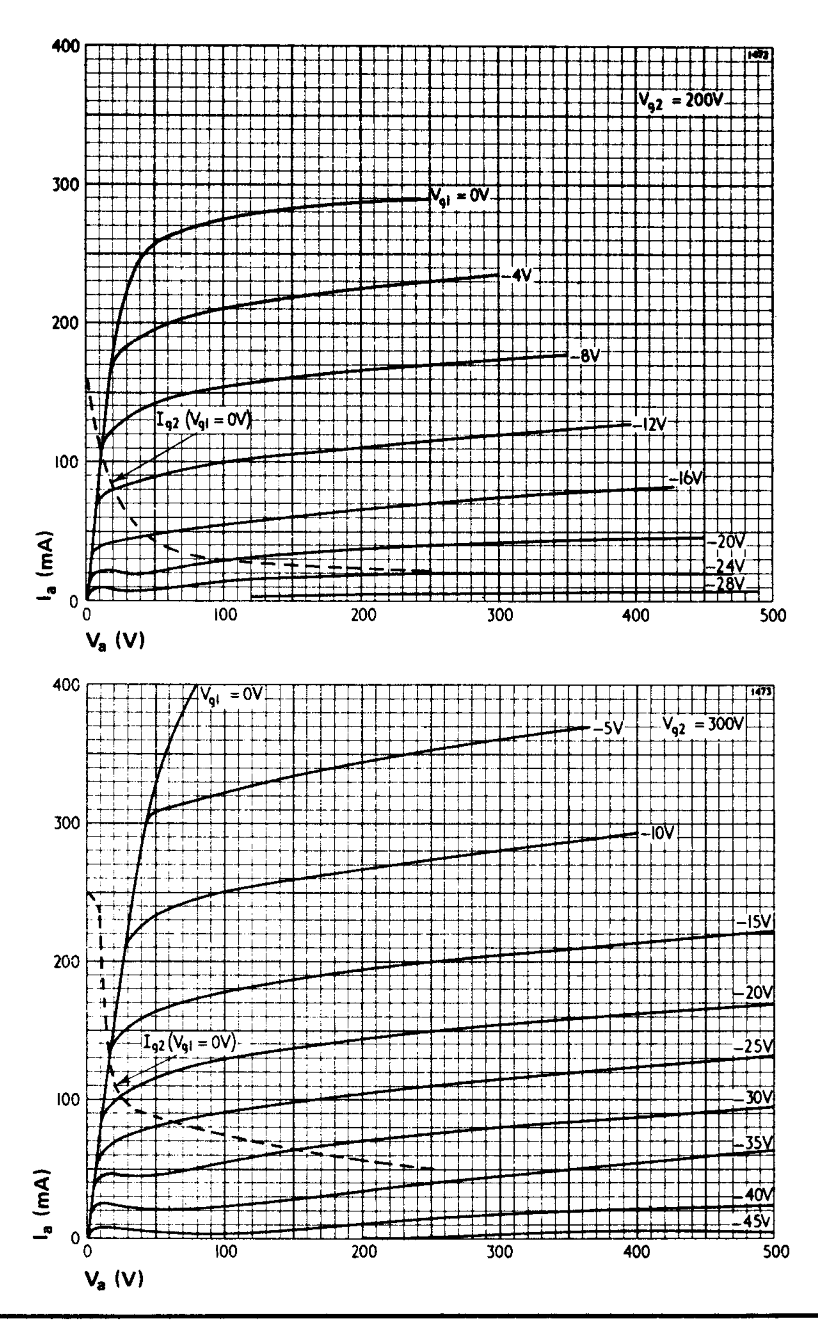
The tube may be mounted either vertically or horizontally.
When tubes are mounted vertically it is recommended that the centres of the tube sockets are not less than 4in. apart and that pins 4 and 8 of each tube are in line.
When tubes are mounted horizontally it is recommended that the centres of the tube sockets are not less than 4in. apart and that pins 4 and 8 of each tube are in the same vertical line. One tube should not be mounted directly above another.
Free air circulation around the tube is desirable.

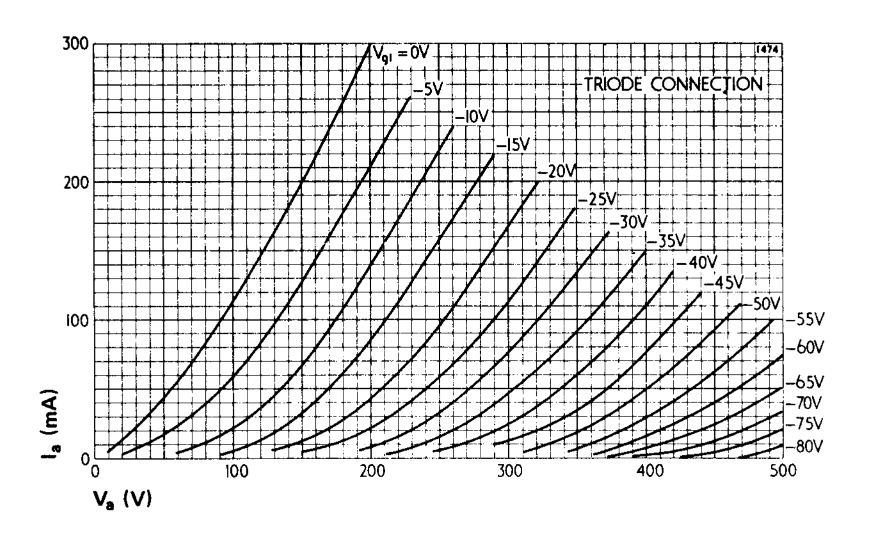
OUTLINE





100
75
50
25
0
V_{g1} = 0V
V_{g2} = 100V
−2V
−4V
−6V
−8V
−10V
−12V
−14V
−16V
I_{g2} (V_{g1} = 0)
I_a (mA)
0
100
200
300
400
500
V_a (V)
1470
200
150
100
50
0
V_{g1} = 0V
V_{g2} = 150V
−2V
−4V
−6V
−8V
−10V
−12V
−14V
−16V
−18V
−20V
−22V
−24V
I_{g2} (V_{g1} = 0V)
I_a (mA)
0
100
200
300
400
500
V_a (V)
1471


400
300
200
100
0
V_{g2} = 200V
V_{g1} = 0V
-4V
-8V
-12V
-16V
-20V
-24V
-28V
I_{g2} (V_{g1} = 0V)
I_a (mA)
0
100
200
300
400
500
V_a (V)
400
300
200
100
0
V_{g1} = 0V
-5V
V_{g2} = 300V
-10V
-15V
-20V
-25V
-30V
-35V
-40V
-45V
I_{g2} (V_{g1} = 0V)
I_a (mA)
0
100
200
300
400
500
V_a (V)



1475
ULTRA – LINEAR CONNECTION – 40% TAPS
V_{g1} = 0V
−5V
−10V
−15V
−20V
−25V
−30V
−35V
−40V
−45V
−50V
−55V
−60V
$V_{a,g2\,(0)}$ = 425V
I_{g2} at V_{g1} = 0V
400
300
200
100
0
I_a (mA)
0
100
200
300
400
500
V_a (V)
255
295
335
375
415
455
V_{g2} (V)